

Remarks

The specification and claims have been amended to address the various objections and rejections made by the Examiner. By separate letter to the Chief Draftsperson, proposed drawing changes are also presented. Specific points raised by the Examiner are discussed below.

Drawings

The Examiner has required that Fig. 1 be labeled "PRIOR ART" (page 2, ¶ 3). While this label is appropriate for drawings intended to depict the prior art, it is inappropriate where, as here, the drawing in question shows "the configuration of a program execution apparatus according to the present invention" (page 6, lines 7-8) (emphasis added). While it may be that the novel features of applicants' invention are not apparent in this figure standing by itself, that is not the criterion for labeling a drawing as prior art. To the contrary, it would be misleading to label Fig. 1 in this fashion. Accordingly, applicants respectfully traverse this requirement.

The Examiner has objected to the drawings on the ground that they allegedly include reference numbers not contained in the specification (page 2, ¶ 4). The first four reference numbers identified (130, 132, 14, 140) in fact appear in the specification at page 13, lines 1-2. The remaining reference numbers identified by the Examiner have been added to the specification by this amendment. Accordingly, no drawing changes are necessary.

The Examiner has also objected to the drawings as failing to comply with 37 CFR 1.84(l), on the grounds that they are "blurry and ill-defined, and the reference characters in particular do not reproduce well" (pages 2-3, ¶ 5). Applicants are submitting herewith another copy of the original drawings, which may be more legible. Additionally, applicants propose to correct the drawings by replacing all boldface reference numbers with plain sans serif reference numbers and by replacing the serif legends in Fig. 1 with sans serif legends. A proposed drawing correction to that effect (using Fig. 1 as an example sheet) is submitted herewith.

The Examiner has additionally objected to the drawings on the ground that the yes and no labels for element S160 in Fig. 3 are inconsistent with the description on page 20 at lines 11-13 (page 3, ¶ 6). A proposed correction of Fig. 3, reversing the yes and no labels for element S160, is submitted herewith.

Specification

The Examiner has objected the disclosure on the ground that incorrect reference numbers appear on pages 25 and 26 (page 3, ¶ 7). These references have been corrected.

The Examiner has objected to the title as not being descriptive (page 3, ¶ 8). Applicants have changed the title to the one proposed by the Examiner.

The Examiner has objected to the appearances of “3” for “∩” on page 24 (pages 34, ¶ 9). This error (which arose because of the use of the Times Roman font rather than the Math B font for this symbol) has been corrected.

Finally under this head, the Examiner has noted the use of the Java trademark in the specification (page 4, ¶ 10). Applicants have amended the specification to add a trademark symbol (™) to the first occurrence of “Java” and identify it parenthetically as a trademark of Sun Microsystems, Inc.

Claims

1. Rejection under 35 U.S.C. § 112, First Paragraph

Claims 1-4 stand rejected under 35 U.S.C. § 112, first paragraph, as failing to comply with the enablement requirement (pages 4-5, ¶ 12). Specifically, the Examiner alleges that the selection of transfer points and the motivation for moving or copying them or points that post-dominate them is not clearly described. Applicants respectfully traverse this ground for rejection.

While the Examiner has couched the rejection as a § 112, first paragraph, rejection, it appears that the Examiner's real concerns may lie with (1) the clarity of the claims and (2) the technical advance of the invention. As for the first of these concerns, they may be addressed by applicants' amendment of the claims in response to the Examiner's § 112, second paragraph, rejection, as described below. In addition, applicants have amended claims 1 and 4 to explicitly define a transfer point as a point "at which program execution is transferred from the interpreter process to the compiled code process", reflecting the language at page 14, lines 28-29.

As for the motivation for performing the steps that are performed, this is set out at length in the specification but is summarized here for the convenience of the Examiner. Page 7 of the specification perhaps most succinctly states the underlying problems that the invention is intended to address. As noted on that page, transfer points (as defined above) can adversely affect code quality since (1) certain optimizations cannot be performed when transfer points are in a loop, and (2) certain optimization methods cannot be performed (lines 8-13).

Applicants address these problems by moving transfer points to the top of a loop if that can be done without causing execution problems to occur (lines 15-16). Additionally, if a transfer point is located inside a loop, code from the top of the loop to a point that post-dominates the top of the loop and the transfer point is copied to a location immediately preceding the top of the loop, and the loop so modified so that the transfer point is located outside the loop or at the top of the loop (i.e., not in the interior of a loop) (lines 18-21). As a result of either of these expedients, the presence of the transfer point does not adversely affect the optimization of the loop (lines 21-22). Finally, provision is made for generating recalculated code if certain activities (e.g., movement of code) are performed above a transfer point.

Page 7, of course, describes only the general features of the invention at a level comparable to that of the claims. Even if this general description is deemed not "enabling", the actual specifics are set out at length in great detail in Figs. 1-8 and accompanying description, so that as a practical matter the problem of enablement does not arise. Applicants therefore respectfully traverse this rejection.

2. Rejection under 35 U.S.C. § 112, First Paragraph

Claims 1-4 also stand rejected under 35 U.S.C. § 112, second paragraph (page 5, ¶ 14), on various grounds as discussed below.

The Examiner asserts that there is insufficient antecedent basis for “said code” in line 12 of claim 1 (page 5, ¶ 15), as well as in line 10 of claim 4 (page 5, ¶ 17). Applicants have amended claims 1 and 4 so that these lines refer merely to “code”, which does not require an antecedent. As amended, this corresponds to description on page 7, which identifies the inability to perform optimization methods “such as the moving of code, and privatization or common sub-expression elimination” as one of the reasons for deterioration of code quality when a transfer point is present. Thus, the code referred to is not the recalculation code, but rather code whose movement passes beyond specific transfer points, as recited in the claim.

The Examiner also points to “said obtained information” in claim 3 as lacking an antecedent (page 5, ¶ 16). Applicants have amended both occurrences of this phrase in claim 3 so that they now read “said generated information”, referring back to the information resulting from the generating step also recited in claim 3.

The Examiner asserts that the recitation “moving said transfer points for code to the top of a loop process when no problem occurs, even when said transfer points are moved to said top of said loop process” in claims 1 and 4 is vague and indefinite “because it is not clear if the transfer points are moved twice” (page 6, ¶ 18). Each of these claims has been amended so that it now recites the step of “moving said transfer points to the top of a loop process if they can be moved there without a problem occurring”. This corresponds to the language on page 7 at lines 15-16 and necessitates only one movement of the transfer points, contingent (“... if they can be moved there . . .”) on their ability to be moved to the top of a loop without causing a problem to occur. That is to say, the transfer points do not have to be moved just to determine whether a problem will occur.

The Examiner asserts that in the recitation “copying to a location immediately preceding said loop process, when said transfer points are located inside said loop process, a point that post-dominates said top of said loop process and said transfer points” in claims 1 and 4, it is “unclear what is copied to the location” (page 6, ¶ 19). These claims have each been amended to recite the step of “copying code from the top of the loop process to a point that post-dominates said top of said loop process and said transfer points to a location immediately preceding said loop process if said transfer points are located inside said loop process” (emphasis added). The emphasized language corresponds to language appearing in the specification at page 7, lines 18-21 (where the phrase “the process” is used instead of “code”), as well as at page 10, lines 29-30. Parsing this language, the matter being copied is “code from the top of the loop process to a point that post-dominates said top of said loop process and said transfer points”, while the destination is “a location immediately preceding said loop process” and the condition for copying is “if said transfer points are located inside said loop process”.

Finally, the Examiner alleges that in claims 1 and 4, the recitation “storing information for generating recalculation code for specific transfer points when the moving of said code and privatization and a common sub-expression elimination that are performed pass beyond said specific transfer points” is vague and indefinite because it is “unclear whether the privatization and common subexpression elimination are moved with the code, or if they are performed independent of the moving of code” (pages 6-7, ¶ 20). Applicants have amended this paragraph in each of the claims so that it now reads “. . . when the privatization, common sub-expression elimination, and movement of code that are performed pass beyond said specific transfer points”. That is to say, “moving of code” has been moved to the end of the series so that is clear that “moving” applies only to “code”.

Conclusion

Reconsideration of the application as amend is respectfully requested. It is hoped that upon such consideration, the Examiner will hold all claims allowable and pass the case to issue at an early date. Such action is earnestly solicited.

Respectfully submitted,
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